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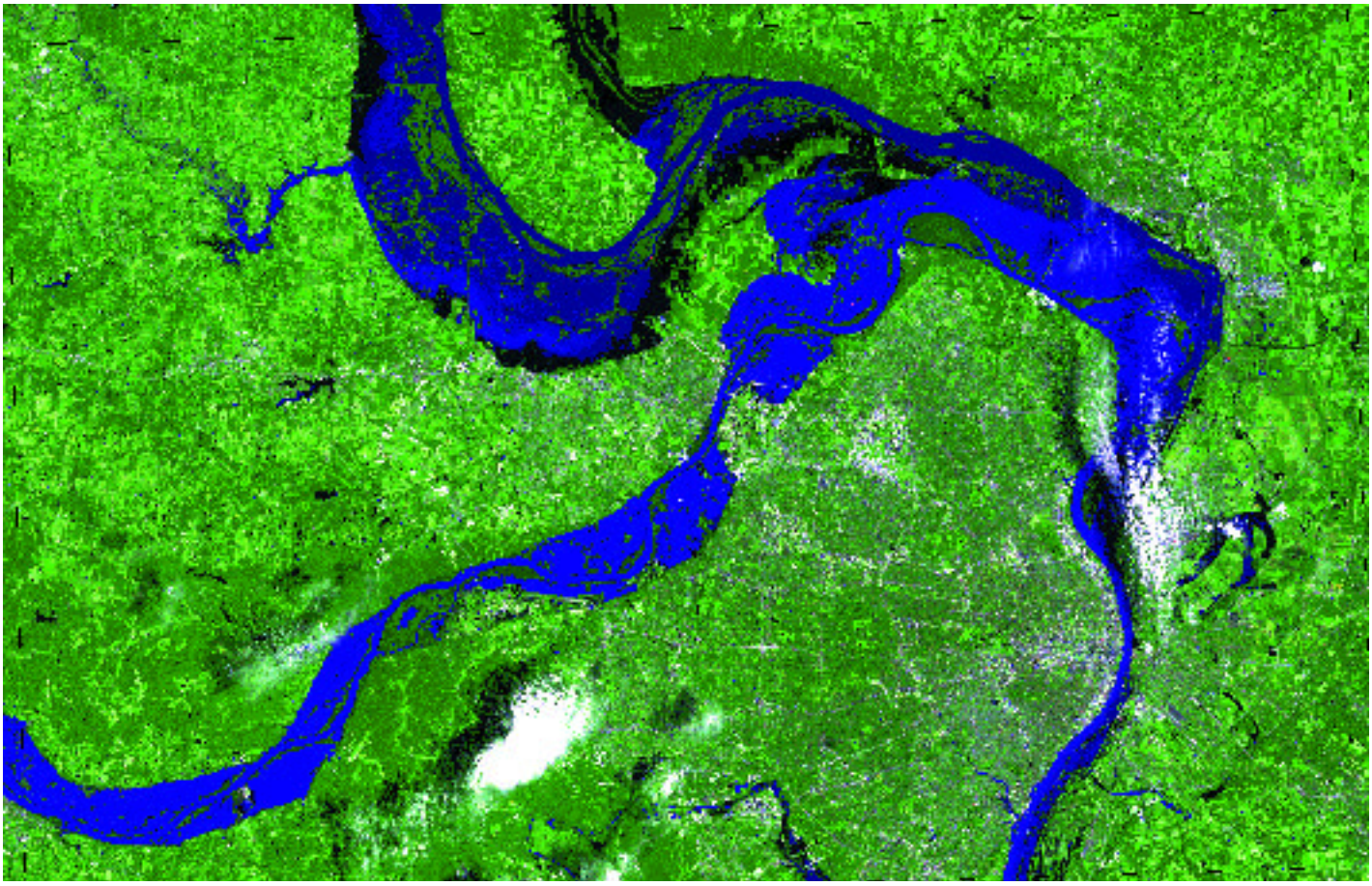
The Scientific Assessment and Strategy Team



Landsat TM image showing near maximum stage of the 1993 flood peak at St. Louis, Mo. Dark blue delineates areas of water.

The flood of 1993 in the Upper Mississippi River Basin caused widespread devastation. The human and economic costs were high. The total flood and other related damage estimates were in the $10 billion to $16 billion range, with total Federal expenditures in excess of $5.4 billion. In response to the effects of the flood of 1993, the White House established the Scientific Assessment and Strategy Team (SAST) on November 24, 1993. The SAST's goals are to provide scientific advice and assistance to policymakers and officials responsible for flood recovery and river basin management in the Upper Mississippi River Basin and to prepare a data base to support those goals.

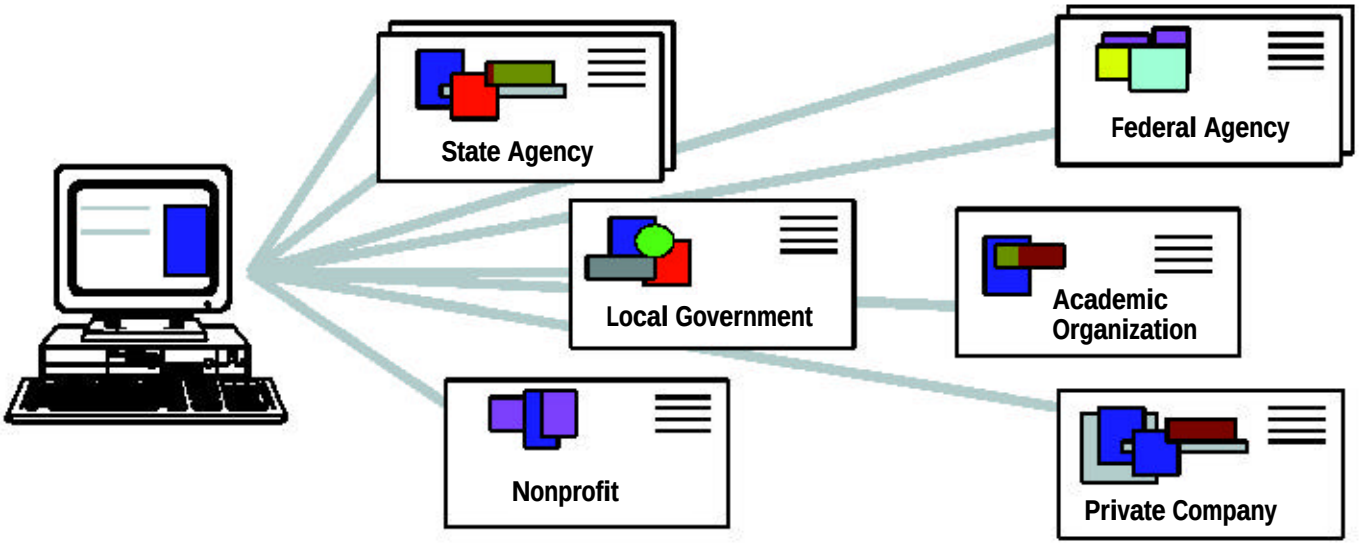
Interagency Participation

The SAST exemplifies how Federal agencies can work with each other and with non-Federal organizations to accomplish national goals. The SAST was an interdisciplinary team of senior scientists and engineers from the Department of Agriculture (Natural Resources Conservation Service), Department of Defense (U.S. Army Corps of Engineers), Department of the Interior (U.S. Fish and Wildlife Service and U.S. Geological Survey), Environmental Protection Agency, and Federal Emergency Management Agency (FEMA). Initial funding was provided by FEMA, and additional funds were provided through two emergency supplemental appropriations to the U.S. Geological Survey (USGS). Critical assistance was also provided by the Department of Commerce (National Weather Service, State governments, the academic community, private industry, and nongovernment not-for-profit organizations.

EROS Data Center Hosts Initial Phase of SAST

The SAST received indepth technical and scientific support from the USGS Earth Resources Observation Systems (EROS) Data Center (EDC) in Sioux Falls, S. Dak., and met at the EDC for an initial

The SAST Clearinghouse



The SAST Clearinghouse meets the specifications of the Federal Geographic Data Committee. Both Federal and non-Federal organizations are responsible for maintaining and distributing data to the user community.

workshop during December 1993 to identify the scope of the problem and to begin to address the many logistical issues that the team would encounter. Beginning in early January 1994, the SAST spent a concentrated 10-week period at the EDC, when most of the 250 gigabytes of data in the SAST Upper Mississippi data base were compiled. After March 1994, the SAST functioned as a distributed team with members working at their home offices or laboratories. The team disbanded in 1997. Additional related scientific work is being done by former members of the team and other scientists. Former team members are often called upon to provide advice or support in solving regional, national, and international problems.

The SAST Upper Mississippi River Data Base

While at the EDC, the SAST built a multiresolution data base covering the geographic extent of the Upper Mississippi River Basin. The most concentrated and complete data are along the floodplains of the upper Mississippi and lower Missouri Rivers. These floodplains represent the areas of greatest interest to policymakers responsible for reacting to the 1993 flood, maintaining the Federal levee system, and restoring habitat. The data base contains advanced very high resolution radiometer, Landsat thematic mapper, and other satellite data; elevation data; selected digitized photographs; historical channel geometries; synthetic structures; geologic, biologic, hydrologic, hydrographic, soil survey, hazardous, and toxic data; and data on many other topics. Numerous links have been made to other organizations, both domestic and international.

Internet Access to the SAST Data Base

Primary access to the data base is through the Internet using commercial browsers that can access data in World Wide Web servers. This allows immediate access to the most current versions of the individual data layers and associated documentation, such as spatial metadata and related publications. For users who do not have Internet access, selected data sets will be made available on digital media by contacting:

Customer Services
U.S. Geological Survey
EROS Data Center
Sioux Falls, SD 57198
Telephone: 605-594-6151

Users can access the SAST data from the following Web site:
http://edcwww2.cr.usgs.gov/sast-home.html

The SAST Distributed Clearinghouse for Data and Information

Data maintenance, management, and distribution primarily use the distributed clearinghouse model. The SAST clearinghouse serves as a prototype for the Federal Geographic Data Committee and helps promote the National Spatial Data Infrastructure and the National Information Infrastructure. The EDC acts as the central node of the SAST clearinghouse. Other Federal, State, local, and tribal governments and nongovernment organizations act as nodes on the system. Each node is responsible for maintaining and distributing its own data to the user community. The EDC assists other organizations in designing mechanisms to meet quality assurance, documentation, data comparability, and distribution requirements.

Floodplain and River Basin Management

The data and information that the SAST has provided to policymakers and floodplain managers assisted them in recovery

and restoration from the flood of 1993 and will allow them to establish effective river basin and floodplain management practices for preventing or lessening the effects of future floods. The SAST recommended that these management techniques incorporate the needs of both the natural ecosystem and human activity. The analysis, results, and recommendations of the SAST have influenced long-term policy on many issues in the Upper Mississippi River Basin. The SAST serves as an example of a comprehensive Federal approach to planning and emergency preparedness.

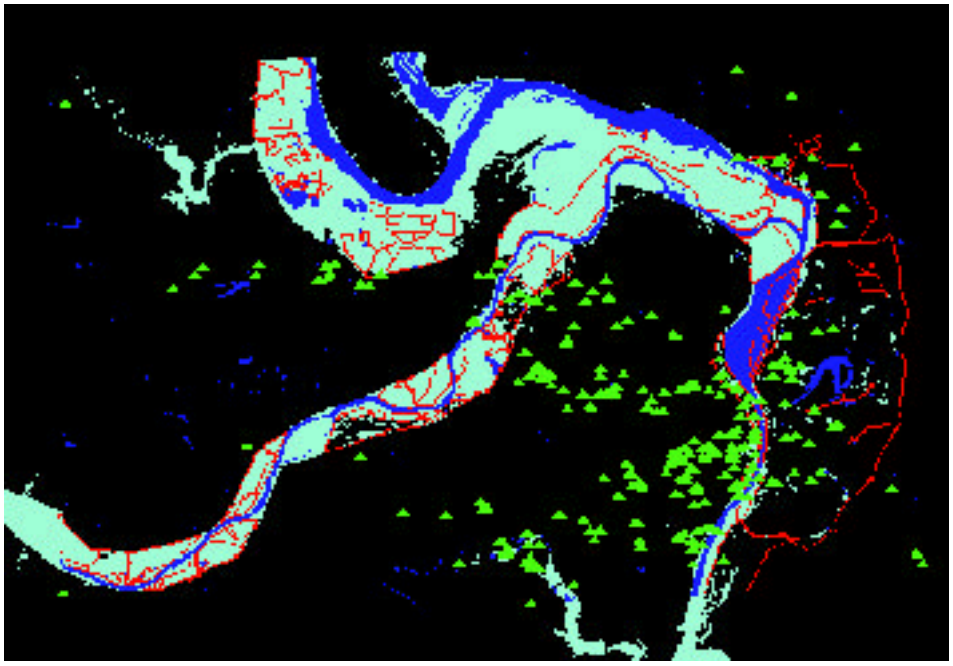
Major Accomplishments and Activities

- Analysis of preliminary flood insurance payment data in the SAST data base revealed that many of the claims were made by people who had only recently purchased flood insurance, some as late as 5 days before the flood. This type of information was critical to helping decisionmakers pass congressional legislation (Riegle Community Development and Regulatory Improvement Act of 1994, PL 103-325) to extend the waiting period to 30 days. This change will save the Flood Insurance Program millions of dollars while still providing coverage to program participants.

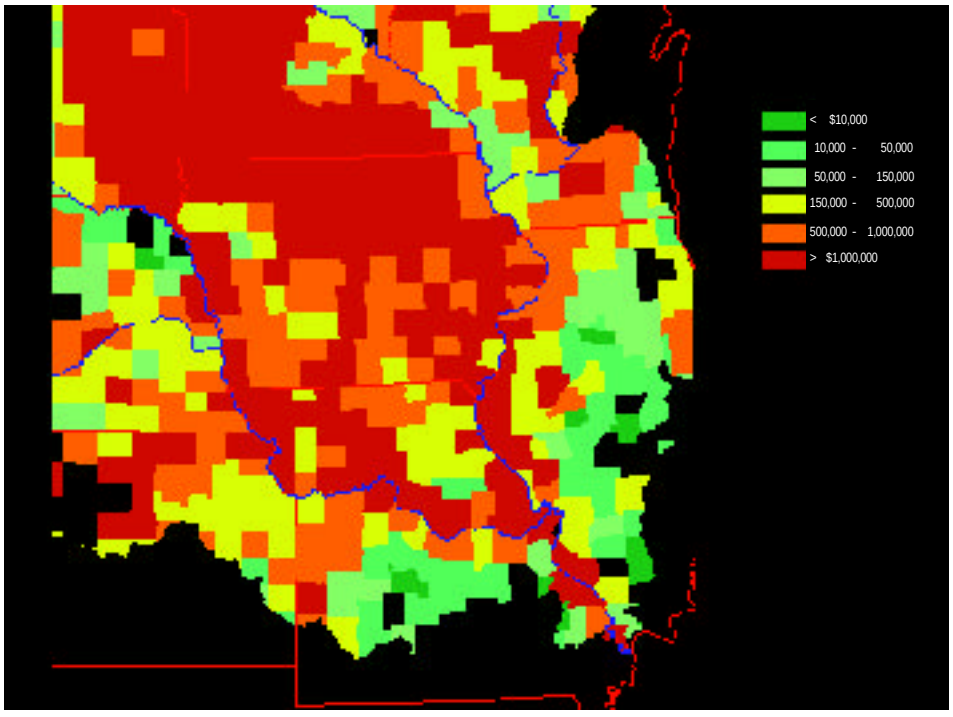
- Parts of the SAST data base were used to help find suitable sites to relocate the entire town of Valmeyer, Ill., from the floodplain to the uplands. Valmeyer was almost entirely destroyed in the floods of 1993.

- The SAST data base is used to delineate priority habitat areas for restoration. The U.S. Fish and Wildlife Service and the State of Missouri have used these data extensively to identify and purchase land of high natural habitat value. A large parcel of land has already been purchased as part of the Big Muddy Wildlife Refuge.

- The SAST, the U.S. Army Corps of Engineers, and private industry cooperated to collect high-resolution, high-accuracy digital elevation models along parts of the floodplains of the upper Mississippi, lower Missouri, and Illinois Rivers. These data were critical to reproducing more accurate and reliable hydraulic models for the area than had existed before. These models are being used to improve floodplain management and protect people, critical infrastructure, and natural habitats in the area.



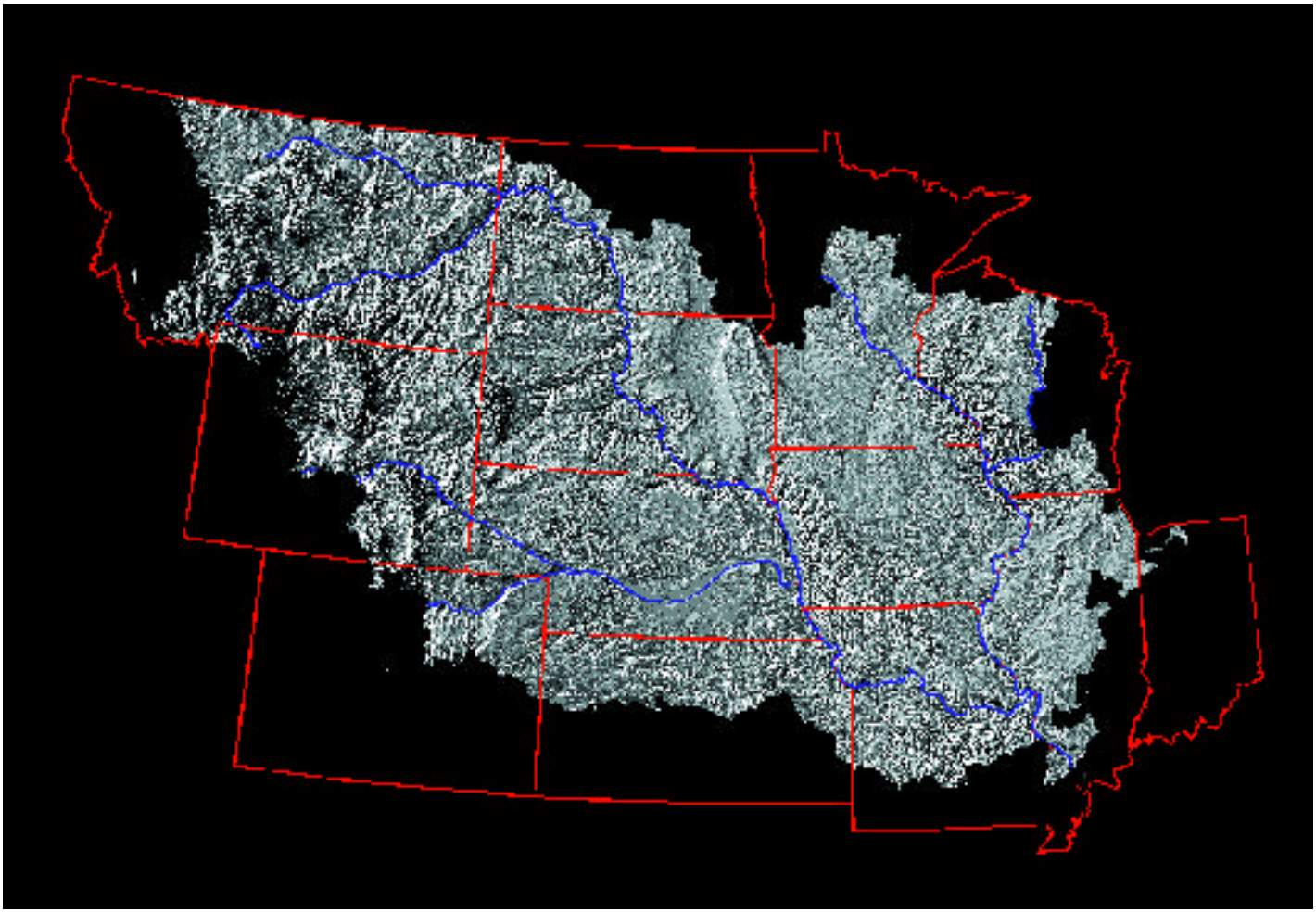
Computer-generated geographic information system image of the St. Louis 1:100,000-scale quadrangle. Orange designates levees and green triangles show toxic release inventory sites. Light blue shows the flood extent in 1993.



Crop disaster payments by county in the Upper Mississippi River Basin. Red areas show greatest dollar payment amounts.

- Studies of land surface and biologic processes on the floodplain have enabled decisionmakers to reassess the economic use of these areas by identifying high-risk zones on the floodplain and high-value habitat restoration sites.

- The SAST produced high-quality map products both on paper and in digital form of various data included in the SAST data base. This information is maintained through the SAST clearinghouse and is accessible to everyone on the Internet or from the EDC.



Digital shaded-relief map showing the topography of the Upper Mississippi River Basin.

- The SAST conducted workshops with other Federal agencies, State and local governments, and nongovernment organizations to promote participation in the National Spatial Data Infrastructure (NSDI) and distributed clearinghouse concept. The SAST data base is part of the NSDI and contains data from a variety of sources. Management of the data is the responsibility of the Federal or non-Federal organization that owns the particular data set.

- A five-volume series containing the scientific findings of the SAST is being published as follows:

Vol. 1—(Part 5 of "A Blueprint for Change") "Science for Floodplain Management into the 21st Century" is out of print, but a digital version is available through the SAST home page.

Vol. 2—"Upper Mississippi River Basin Data Base and Clearing House" is in preparation.

Vol. 3—"Overview of River-Floodplain Ecology in the Upper Mississippi River Basin," 1996.

Vol. 4—"Selected Studies on Natural and Human Factors Related to Flood Management in the Upper Mississippi River Basin," in press.

Vol. 5—"Proceedings of the Scientific Assessment and Strategy Team Workshop on Hydrology, Ecology, and Hydraulics," 1994.

For More Information

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For information on these and other USGS products and services, call 1-888-ASK-USGS, use the Ask.USGS fax-on-demand system, which is available 24 hours a day at 703-648-4888, or visit the general interest publications Web site on mapping, geography, and related topics at http://mapping.usgs.gov/www/products/mappubs.html.

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